

# **McDowell Research Corporation**

## **Capabilities Briefing**

**June 2001**



**McDowell Research Corporation - 300 South 8<sup>th</sup> Street - Waco, TX 76701**

(254) 752-1411 - (254) 752-1812 (FAX) - [info@mrc-power.com](mailto:info@mrc-power.com) - [www.mrc-power.com](http://www.mrc-power.com)

# McDowell Research Corporation

- **Alternate Power Systems**
  - Worldwide AC, DC and Battery Solutions
- **Communications Systems Integration**
- **Specialized Development and Manufacturing**
- **Small Business**
  - Capability and Capacity to react to customer driven requirements
  - Systems integration coupled with “black box” design
- **We do it quicker for less \$ and we guarantee it works!**



**PRC-117F  
w/MRC-77**



**PRC-119 w/MRC-33**



**PSC-5 w/MRC-50**



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# McDowell Research Corporation

## A Power Solutions Company

- **Design and manufacture power solutions**
  - Tactical Radio power supplies
  - Encased integrated communications and power solutions
  - Installation kits for Tactical Communications
  - Battery chargers
  - Batteries
- **Markets Tactical Communications solutions**
  - Harris tactical transceivers available on GSA
  - Harris authorized source for radio accessories



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# MRC Product Characteristics



- **Products are designed to operate worldwide**
  - Compatible with worldwide AC/DC power sources
  - Products including a battery act as a UPS
    - Automatic battery charging part of those products
- **Product design expects worst case use**
  - Tested to all meet war fighters environments
- **Product designed for maximum cost savings**
  - Intended to replace non rechargeable batteries
  - Integrate or support Tactical radio operation



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# McDowell Research

## Product Commitment

**We design and manufacture: Power Systems, Mounting Racks and Battery Chargers for tactical radios**

Universal AC and DC inputs for worldwide use  
... 95 to 260 VAC - Universal AC Inputs  
... 11 to 36 VDC - Universal DC Inputs



Multi-Mode Multi-Chemistry Battery Chargers –  
... NO PROGRAMMING REQUIRED  
... BB-2590, BB-390, BB-490 and BB-590 capacities



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# POWER SUPPLIES AVAILABLE

<b>AN/PSC-5 MBMMR</b>	<b>AN/PRC-117F</b>	<b>AN/PRC-150</b>
<b>AN/PRC-138</b>	<b>AN/LST-5</b>	<b>AN/PRC-119 SINCGARS</b>
<b>AN/PRC-117 A-D</b>	<b>AN/KG-194A &amp; KY- 57/KY-99</b>	<b>AN/PRC-113</b>
<b>AN/URC-200</b>	<b>MST-20/HST-4</b>	<b>AM-50/AM-6000</b>
<b>AN/PSC-3</b>	<b>AN/PSC-10</b>	<b>AN/CSZ-1/SUNBURST</b>

**McDowell Research Corporation also developed specialized power supplies and adapters for other transceivers and rugged applications**



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# New Products from McDowell

- **Composite EnRoute Comm Rack**
- **RMT- 8 Power Supply**
- **MRC-67A Amplified Speaker**
- **Vehicle installation kits**
  - Tactical radios
- **MRC-34 Portable Communications System**
  - provisions for one tactical radio, speaker, antenna & CPU
- **MRC-65 Multi-Radio Operations Station**
  - Four radios, encryption devices, cables, speakers & antennas
- **MRC-2590 Re-chargeable Lithium-Ion Battery**



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# New Product from McDowell

## EnRoute Communications Rack

- **Integrate COTS equipment into light weight mobile rack**
  - Composite Rack - Designed for reconfiguration
    - Provisions for up to 3 Radios - User selectable (PSC-5, PRC-117F, PRC-138 or PRC-150)
    - Supports DAMA Amps for each Transceiver
    - ICS with interface to Cockpit radio control/w five ICS spigots (Wired or Wireless Interface)
  - Procure and integrate all hardware
  - Provide RF and Power interfaces
    - AC or DC Power Input
  - Empty Rack is 20 pounds
  - Size 36"H x 24"W x 20"D
  - Attaches to Aircraft Seat Tracks requiring one Troop Position
  - Can be configured for integration on vehicle, aircraft or boats



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## COTS EnRoute Rack

**Reconfigure for:**

**Fixed Wing/Rotor Wing Aircraft**

**Rib Boats/Patrol Craft**

**Wheeled and Tracked Vehicles**

**Shelter and Portable Base Station Systems**



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# New Product from McDowell

## MRC-65 Multi-Transceiver Station

**Low Profile - One Operator -  
Worldwide use**

**Developed with Mobile Comm Team at Coronado, CA**  
**Transportable via commercial means**

- Provisions for Four transceivers
- Provisions for Two Encryption devices
- Built in Racks
- Standard MRC-82 Power Supplies
- Readily usable with computers
- Rugged Composite Case w/rollers
- Storage for cables & antennas



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# New Product from McDowell

## Portable Case System - MRC-34

- **Compatible w/commercial transport**
- **Tactical Operations Center (TOC)**
- **Worldwide Power usage**
- **One person carry**
- **Fixed Site, Aircraft, Vehicle Applications**
- **Operational with PSC-5, PRC-117F, PRC-138, PRC-150**
- **Compact Single Unit Package for easy transportation**
- **Multiple configuration possibilities with single package**



**MRC-34 with PSC-5, MRC-50 and MRC-67**



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# New Products from McDowell

## SatCom On the Move

- Designed, delivered and installed OS-302 Kits for MARSYSCOM supporting Camp LeJuene, Camp Pendleton, Camp Hanson (18 systems total)
  - Install for 4<sup>th</sup> ID Ft. Hood (Soft top)
  - Install for 4<sup>th</sup> ID Ft. Hood (Hard top)
  - Install 3<sup>rd</sup> SFG Ft. Bragg for Kuwait Exercise
  - Install LAV for I MEF Camp Pendleton
- 
- Passed NTC Test
  - No co-site interference including EPLRS
  - Passed Munson Road Tests
  - Low profile antenna system
  - HMMWV A1 and A2 variants with a single
  - HMMWV Tailgate kit



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# MRC SOTM INSTALLATIONS



**HARD-TOP  
INSTALLATIO  
N**



**TROOP  
CARRIER  
INSTALLATIO  
N**



**HMMW  
V KITS  
IN  
WORK  
AT MRC**



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# RECHARGEABLE LITHIUM-ION BATTERY MRC-2590

- **90% OF BA-5590/U PERFORMANCE FOR 5% OF OPERATIONAL COST**
- **5 AMP/HR CAPACITY AT 28.8 VDC WHICH GIVES ADDED HEADROOM**
- **FLAT DISCHARGE CURVE PREVENTS EARLY TRANSCEIVER SHUTDOWN**
- **TOTALLY SAFE FOR TRANSPORTATION AS NO METALLIC LITHIUM USED IN CONSTRUCTION**
- **-30°C TO +60°C OPERATIONAL PERFORMANCE**
- **LOW INTERNAL IMPEDANCE ALLOWS 10 AMP OUTPUT FOR SHORT DURATION**
- **OPERATE PRC-117F OR PSC-5 FOR OVER 4 HOURS ON SINGLE BATTERY 10% DUTY CYCLE**
- **MRC-85, MRC-86 and MRC-88 MULTI-BATTERY MULTI-CHEMISTRY CHARGERS AVAILABLE**



## **MRC-2590 Rechargeable Lithium-Ion Battery**

**Developed by McDowell  
Research for DOD  
Applications**

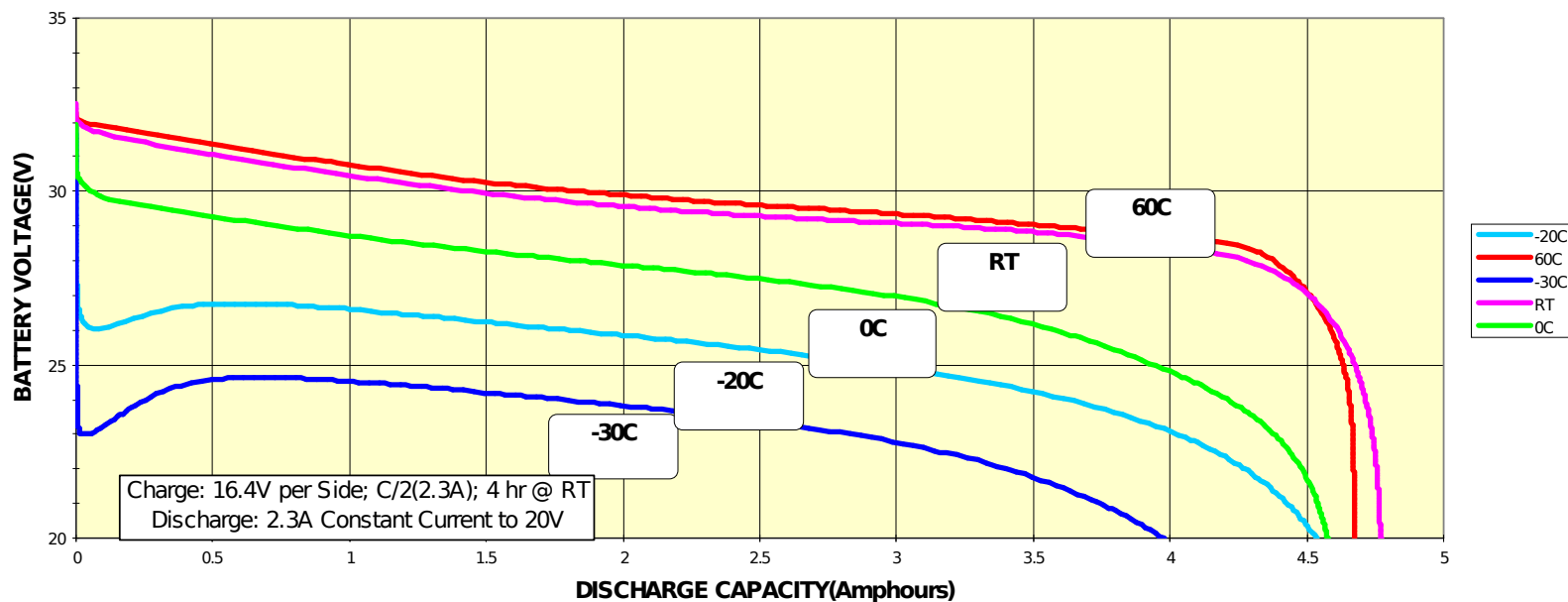


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# MRC-2590 Rechargeable Lithium-Ion Temperature Performance Chart

MRC-2590 Lilon TYPICAL DISCHARGE CURVES  
C/2(2.3A) AT VARIOUS TEMPERATURES



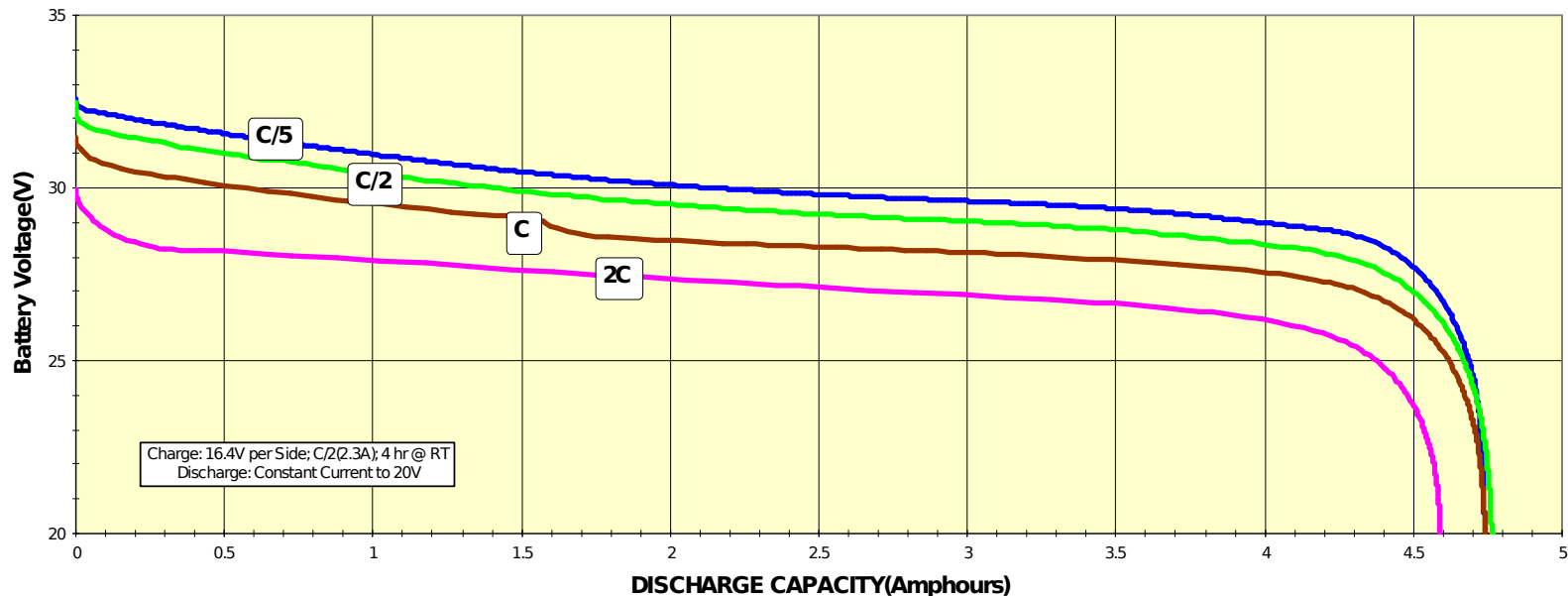
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# MRC-2590 Rechargeable Lithium-Ion Discharge Curve versus Load

MRC-2590 Lilon TYPICAL DISCHARGE CURVES  
Room Temperature C/5 to 2C Rate (C rate = 4.6A)



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# MRC-2590 Rechargeable Lithium-Ion Operational Cost Comparisons

<b>Transceiver</b>	<b>BA-5590/U Hourly Costs</b>	<b>MRC-2590 Hourly Costs</b>	<b>BB-390/U Hourly Costs</b>	<b>BB-590/U Hourly Costs</b>
<b>AN/PSC-5</b>	<b>\$12.29</b>	<b>\$0.70</b>	<b>\$2.54</b>	<b>\$1.60</b>
<b>AN/PRC-117F</b>	<b>\$12.98</b>	<b>\$0.74</b>	<b>\$2.68</b>	<b>\$1.68</b>
<b>AN/PRC-138</b>	<b>\$10.11</b>	<b>\$0.58</b>	<b>\$2.09</b>	<b>\$1.31</b>
<b>AN/PRC-150</b>	<b>\$12.04</b>	<b>\$0.69</b>	<b>\$2.49</b>	<b>\$1.56</b>
<b>AN/PRC-113</b>	<b>\$8.02</b>	<b>\$0.46</b>	<b>\$1.66</b>	<b>\$1.04</b>
<b>AN/PRC-104</b>	<b>\$14.10</b>	<b>\$0.81</b>	<b>\$2.92</b>	<b>\$1.83</b>
<b>AN/LST-5</b>	<b>\$9.05</b>	<b>\$0.52</b>	<b>\$1.87</b>	<b>\$1.17</b>
<b>AN/PRC-117 A-D</b>	<b>\$8.33</b>	<b>\$0.48</b>	<b>\$1.72</b>	<b>\$1.08</b>
<b>AN/PRC-119</b>	<b>\$4.65</b>	<b>\$0.27</b>	<b>\$0.96</b>	<b>\$0.60</b>



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# Product Commitment

## MRC-85, MRC-86, MRC-38 and MRC-54 Battery Chargers

- **SAVES POWER DOLLARS - Lowers Battery costs**
- **Smart Unattended charging capability - AC or DC Input**
- The MRC case chargers/conditioners are self contained providing a reliable and consistent recharge of two or up to six batteries simultaneously in any combination of the following:

- **MRC-2590 - LITHIUM ION**
- **BB-390/U - NICKEL METAL HYDRIDE\***
- **BB-490/U - SEALED LEAD-ACID**
- **BB-590/U - NICAD\***
- **BB-690/U - SEALED LEAD-ACID**

**\*BUILT-IN CONDITIONING CAPABILITY**



**MRC-54  
Charger/Conditioner**



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# Product Commitment

## MRC-88 and MRC-57 Vehicle Mounted Charger

### Designed to save operational dollars

Smart charger - Usable in all 24 VDC vehicles

- Five battery charger
- Supports the following batteries

MRC-2590 - LITHIUM ION

BB-390/U - NICKEL METAL HYDRIDE\*

BB-490/U - SEALED LEAD-ACID BATTERY

BB-590/U - NICAD BATTERY\*

BB-690/U - SEALED LEAD-ACID BATTERY

\*BUILT-IN CONDITIONING CAPABILITY



**MRC-57**  
**Charger/Conditioner**



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# MRC-82 POWER SUPPLY

- **WORLD-WIDE OPERATION FROM AC OR DC POWER SOURCES**
- **INTERNAL MRC-2590 RECHARGEABLE LITHIUM-ION BATTERY**
- **OPERATE TRANSCEIVER FOR OVER FOUR HOURS FROM SINGLE BATTERY OPERATION**
- **AUTO SHUT-OFF TO PREVENT INTERNAL BATTERY FAILURES**
- **SAFE FOR ALL TRANSPORTATION MODES**
- **DEVELOPED FOR NEW HIGH CURRENT REQUIREMENT TRANSCEIVERS**



**PRC-117F with MRC-82, RMT-2  
and MRC-67**



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# McDowell Product Commitment

## PSC-5, PRC-138, PRC-150 & PRC-117F



**PSC-5 with MRC-50,  
RMT-2 and MRC-67**

### Vehicle Installation Solution

- MRC-50, MRC-77 or MRC-82 with RMT-2 Mount
- Self contained power system
- Integral charger and battery with MRC-82 and MRC-50 Supplies
- Adjustable radio rack
- MRC-67A Amplified Speaker

**MRC-50**



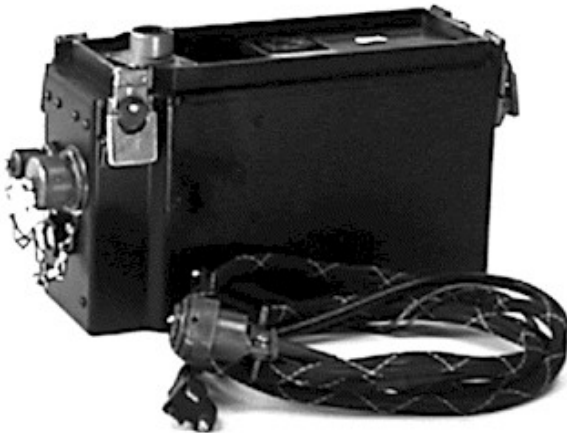
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# McDowell Product Commitment

## MRC-33 SINCGARS Support

- **REDUCE OPERATIONAL COSTS**
- Self contained power system for AN/PRC-119 Radios
- Integral charger and battery



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# McDowell Product Commitment

## MRC Power Solutions

### Tactical Satellite Radio installation Kits



- **PSC-5 - Joint Service supplier**
  - MRC-50, MRC-32, RMT-2, MRC-67A Amplified Speaker
- **PRC-117F - Support products**
  - MRC-77, MRC-82, RMT-2, MRC-67A Amplified Speaker



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# New Product from McDowell

## MRC-67A Amplified Speaker

- **Embedded 5 Watt Audio Amp**
- **Automatic Muting w/handset attached**
- **Handset always functional**
- **Volume Controls**
  - Speaker and Handset
- **Adaptable to existing equipment**
- **Waterproof Construction**
- **Supports all Transceivers**
- **100 Foot Remote Operation**



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# McDowell Product Commitment

## MRC-74/RMT-8 Power Supply

### Low Cost High Current Supply

- **Garrison, Vehicle and Airborne Radio Racks supporting:**
  - PSC-5, PRC-117F, PRC-150 & PRC-138
- **53 Amps with 95 to 260 VAC, 47 to 440 Hz Inpu**



**MRC-74  
Power Supply**



**RMT-8 Power  
Supply**

**Power for vehicle mount rack variants  
RMT-8 field proven in TACP Rack**



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# SPECIALIZED CABLES and SUPPORT EQUIPMENT



**PC-25F COMPUTER BATTERY  
POWER CABLE**



**PC-20  
COMPUTER  
INTERFACE  
CABLE**



**PC-90 BATTERY  
INTERFACE  
CABLE**



**PC-12 SIDS  
POWER CABLE**



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# McDowell Research Commitment



## FACILITIES

- 23,000 sq. ft. Manufacturing and Engineering Facility
- On-Site Electronics and Cable Assembly Equipment
- Multi-Axis CNC Machining Center
- Environmental Stress Screening Chamber
- EMC Test Cell

## Home Offices

Separate On-Site

8,000 sq.ft.

Vehicle Integration  
Facility



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# In-House Test Facilities



## Environmental Stress Screening Chamber

Heat and Cold Cycling

Random Vibration Cycling

Computer Controlled

## EMI/EMC Test Chamber

Emission Frequency Range - DC to >1 GHz

Susceptibility Frequency Range - DC to > 1GHz

Computer Controlled



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# Manufacturing Support Equipment



## CNC Milling Center

- **PMC-5VT20 -3 Axis Machine Center**
- **High Speed Automatic Tool Changer**

## Wire and Cable Equipment

- **Cutting and Marking**
- **Connector and/or open end**
- **Labeling**
- **Shielded and Non**



**Shielded**

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**Mixed Harnesses**

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# McDowell Customer Commitment

## Key Benefits

- **Small Business**
- **Flexible**
  - Quick Response
  - Work done in-house
- **Low Overhead**
- **Support Users with designs developed for special requirements**
- **Many items assigned NSN - available directly from MRC using PO or Credit Card or via GSA**
- **We do it quicker for less \$ and we guarantee it works!**



**MRC-34 SYSTEM**



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